

Guidelines for Assessing the Reliability and Validity of Tools, Techniques and Methods Used to Support Influence Operations

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ABSTRACT

This paper provides recommended guidance for assessing the reliability and validity (R&V) of the tools, techniques and methods (TTMs) developed to support the planning and execution of operations primarily intended to affect human and social behaviour. R&V are important as they confirm the scientific credibility of TTMs. This, in turn, underpins confidence in the decisions that are facilitated through their use by MoD staff. These guidelines detail the issues of R&V that are relevant to these TTMs, why they should be assessed, and the practical tests and procedures that should be implemented during the development phase and in use.

The paper was originally published within Dstl as DSTL/TR18609 v1 in March 2006. It was written by Stephen Moore, working under the team leadership of Philip Jones. It has been subject to minor updates and cosmetic alterations for publication within NATO HFM SY202.

1.0 INTRODUCTION

Tools, techniques and methods that inform understanding of human behaviour are often considered to be more subjective than the modelling approaches commonly referred to as ‘Hard Operational Analysis’, which are used to support central MoD UK policy, planning and acquisition decisions. D Scrutiny, MoD has outlined an approach for increasing confidence in the reliability and validity of these hard Operational Analysis models, referred to as Verification and Validation [1].

The guidelines suggested in this report are intended to complement the D Scrutiny approach, but they focus more specifically on increasing confidence in the wide variety of tools, techniques and methods that are used to support the Human / Social component of military operations. For convenience, the term Influence Operations is used throughout the remainder of the report as shorthand for this component.

This paper provides recommended guidance for assessing the reliability and validity of the tools, techniques and methods developed to support the planning and execution of Influence Operations intended to affect human and social behaviour. Reliability and Validity (R&V) are important because they confirm the scientific credibility of tools, techniques or methods (hereafter referred to as TTMs). This, in turn, underpins confidence in the decisions that are facilitated through their use by MoD staff. These guidelines detail the issues of R&V that are relevant to these TTMs, why they should be assessed, and the practical tests and procedures that should be implemented during the development phase and in use.

2.0 AIM AND OBJECTIVES

The aim of this paper is to provide structured and pragmatic guidance that will align the assessment of R&V during Influence Ops TTMs development more closely with that of traditional Operational Analysis (OA) models. The key objectives are to ensure that Influence Ops TTMs:

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- a) Are developed in a sufficiently robust fashion so that they are rigorous and objective.
- b) Have been adequately validated.
- c) Have sufficient scientific credibility, auditability and confidence in their reliability to justify their practical use by MoD staff.
- d) Have undergone a sufficient assessment of any uncertainty to allow MoD staff to evaluate the benefits and risk of their practical use or non-use.

3.0 STRUCTURE OF THESE GUIDELINES

This paper first outlines the goal of R&V assessment, which is the evaluation of fitness for purpose. It then details the recommended assessment process, the assessment scale and the process of recording the assessment in a log book. This paper then provides detailed recommendations on the issues that should be considered and addressed during the assessment process. It concludes with a summary of the key points and recommendations.

4.0 SCOPE

These guidelines are generally consistent with the overarching D Scrutiny guidance on Verification and Validation (V&V). However, they focus more specifically on the R&V issues associated with the subjective analysis, interpretation and prediction of human and social behaviour, as well as the greater diversity in the purposes and methodologies of Influence Ops TTMs. This means that certain aspects of V&V, such as quantitative systems testing or hypothesis testing, may not always be applicable to all Influence Ops TTMs. This is because Influence Ops TTMs may be partly or entirely qualitative, and because certain Influence Ops TTMs may not produce predictions that can be tested for accuracy against specific real world events.

Influence Ops TTMs can vary distinctly in their purpose and their methodology, they may be:

- Procedural tools, intended to guide MoD staff through a recommended approach to planning and executing Influence Ops.
- Workshop techniques intended to facilitate discussion and debate between decision-makers.
- Research methods intended to identify the attitudes and perceptions of a subject group.
- Analytical processes intended to provide predictions on the potential responses of a target group to certain actions.

These guidelines therefore recommend a broad approach to R&V assessment, which accounts for the diversity in these types of TTMs, and incorporates a number of additional factors that are considered pertinent to this type of analysis.

These guidelines are not intended to be a procedural straightjacket to the development process, particularly to those who are already experienced TTMs developers. However, they do constitute a ‘good practice’ approach for increasing the rigour and credibility of the analytical support to Influence Ops planning and execution. It is therefore highly recommended that this approach is implemented as an integral part of the development process.

4.0 RELIABILITY AND VALIDITY ASSESSMENT

4.1 Evaluating Fitness for Purpose

R&V assessment should be primarily intended to support an evaluation of whether Influence Ops TTMs are fit for purpose. This means that the use of these TTMs should constitute a sound contribution to the planning and execution of Influence Ops. R&V assessment should aim to establish whether TTMs have been developed, reviewed and tested, where appropriate, to the extent that there is sufficient confidence that they can fulfil the intended purpose as reliably and validly as possible. It should also establish whether there is uncertainty in any part of a TTM, or in any specific analytical outputs, if a TTM produces them. This assessment will help an end user to evaluate the benefits and risks of using, and not using, a particular TTM. Furthermore it will help them to balance the risk of any uncertainty against their requirement for support with a particular task.

Importantly, TTMs can be evaluated as fit for one purpose but not for another. TTMs should not be categorised as valid or invalid in isolation. This is because the overall evaluation of whether Influence Ops TTMs are fit for a particular purpose is ultimately a subjective judgement, dependent on the specific situation and the nature of the end user's purpose for the TTM. These guidelines therefore also reject a system of accreditation, as does the D Scrutiny guidance, in favour of a continuous review and revise approach. Although the evaluation of fitness for purpose is a subjective judgement, it can be based on the confidence in the R&V of a TTM, which is built up through the R&V assessment process. Fitness for purpose is therefore a combination of both reliability and validity:

- **Reliability.** The key principles are consistency and repeatability. Influence Ops TTMs are reliable if they can repeatedly reproduce a process and maintain consistent accuracy in any outputs. If they are reliable then they are capable of fulfilling their stated intention.
- **Validity.** The key principles are appropriateness, accuracy and utility. Influence Ops TTMs are valid if they utilise appropriate techniques, theories, Subject Matter Experts (SMEs), data and staff, if any analysis of a subject is as accurate as possible to the self-interpretation of the subject themselves, and if they are useful to their intended end user. If they are valid then they are capable of fulfilling their specific purpose identified by the end user.

4.2 The Assessment Process

The assessment of R&V should be an iterative process that is integrated and conducted throughout the development of Influence Ops TTMs. It should also then continue after the TTMs have been developed, although to a less frequent extent, to ensure the R&V has not changed over time or that the TTMs are fit for a new purpose for which they will be utilised. R&V assessment should therefore progress through a review and test phase detailed below.

4.2.1 Review

Evaluation by a series of reviews of all key R&V issues, as described in section 5, to include repeatability, consistency, appropriateness, accuracy and usefulness:

- Peer review to provide a continual progress check on development by appropriately qualified colleagues.
- Expert review by relevant SMEs internal and external to MoD, both scientific/academic and military if relevant. This may include scrutiny by a panel of external experts from a variety of backgrounds, or exposure at a conference, symposium or other similar event.
- Customer review and feedback on the utility of a TTM, the specific analytical outputs (if there are

any), and the outcomes of its use.

- Continued expert review, post-development, by an Oversight Group composed of the TTM custodian and users, and SMEs, to ensure relevancy and currency of the TTM.

4.2.2 Testing or Comparison

- Test of individual components, such as inter-coder reliability, V&V of software tools, or comparison of outputs from content analysis software with those of manual analysis.
- Assessment of the predictive capability (if this is the function) in controlled test cases.
- Comparison of specific analytical outputs / predictions (if there are any) with similar analytical products (e.g. from similar TTMs, possibly developed by another country).
- The collection and analysis of data to provide a comparison of outputs / predictions (if there are any) with historical data and actual developments in the real world.

4.3 Assessment Follow-up Actions

The outcome of each of these phases should be followed-up and any amendments required to the TTMs should be made accordingly. Several of these phases can be conducted concurrently, some can be repeated, and others may not actually be applicable to a particular type of TTM. TTMs developers should aim to conduct as many as possible, where feasible and appropriate, and to do this in a systematic and objective manner. This requires judgement on behalf of the developer(s) and the end user(s) on what will be sufficient to evaluate a TTM's fitness for purpose. Ideally the TTM developer(s) should outline a specific timeline for these phases, at the outset of the development process, and agree this with the end user(s) before development begins. This paper does not provide specific guidance on detailed testing plans for particular TTMs as this is the responsibility and area of expertise of the custodian, and the experts involved in the review phases, to determine.

4.3.1 The Assessment Scale

The D Scrutiny guidelines recommend a three-tier assessment scale as follows:

- Level 0 is 'Unvalidated'.
- Level 1 is assessment 'by review'.
- Level 2 is assessment 'against real events'.

The D Scrutiny guidelines explain that evidence may not always be available to cover the full spectrum of assessment needed, in which case the weight of assessment rests largely on the review procedures. These guidelines recommend a similar approach and stress that, due to the diverse nature of Influence Ops TTMs, the ability to achieve these levels may not be wholly applicable to all. The type and purpose of Influence Ops TTMs vary distinctly, as some produce specific analytical predictions and/or situational awareness, whilst others facilitate discussion, debate and planning processes. It is therefore recommended that the R&V of each TTM is assessed to the greatest, practical extent possible that is relevant for that type of TTM.

These guidelines recommend that for all TTMs that do not produce specific analytical outputs, such as predictions, the aspiration should be to achieve Level 1, where the R&V has undergone a full assessment by all the phases of review listed in sub-section 4.2.1. For those TTMs that do involve some form of analytical output the aspiration should be to achieve both Level 1 and Level 2, where this analytical output has also been tested, assessed and/or compared as fully as possible, using the procedures listed in sub-

section 4.2.2.

Evaluating Risk. TTM developers and end users should agree the required level of R&V assessment, and the risk they are willing to accept, at the outset of the development process. The primary aim of R&V assessment is to establish a sufficient level of confidence for the end user to be satisfied that the TTMs are fit for their particular purpose. The time and effort invested in an R&V assessment should therefore not be disproportionate to the value of the increased confidence that can be established. One of the key objectives of the R&V assessment process is to help the end user evaluate the risk of using and also not using a TTM to support them. Awareness of R&V issues will help the end user balance the risks associated with uncertainties in the TTM, and its outputs, against the risks associated with the decisions the end user is making. For example, an analytical Influence Ops TTM might provide assessments of how subject individuals may behave in certain situations, which may be used to support the planning of Influence Ops activities. However, if the assessment is based on relatively little source material, there may be a lack of confidence in the conclusions. In this case the decision-maker should be advised of the risk of relying too significantly on the output and that any planned Influence Ops activities could result in negative unforeseen or undesired consequences.

4.3.2 The Log Book

It is recommended that the R&V assessment process is recorded in a log book. The production of a log book should begin at the outset of TTM development and it should record all activity undertaken during the R&V assessment. A log book brings together all the information and evidence of R&V that has been conducted to-date, including a record of when and where the TTM has been used and, if appropriate, a measure of its success. It provides an audit trail for the assessment process and highlights areas of R&V that still need to be improved. This records the evaluated fitness for a particular purpose and therefore constitutes a key document that can support an end user in assessing the risks of utilising a TTM to support them with a particular task. It also provides an archive in which to record valuable information about a TTM to ensure that it is not lost when a particular individual is no longer involved in using that TTM. A custodian should be appointed for a TTM and have responsibility for regularly updating the log book to incorporate amendments and further developments to the TTM or its R&V status. A recommended template for this log book has also been produced

The log book should include the following sections:

- a) TTM name and overview description.
- b) Intended domain of use.
- c) TTM custodian.
- d) TTM management authority and any Intellectual Property Rights.
- e) Relationship with other tools, techniques and methods.
- f) History of development and use.
- g) Requirements: staff (training, skills, experience), time, information, software, hardware.
- h) List of available staff with expertise and experience.
- i) Management control systems: boundaries of use, change control procedures.
- j) Accessibility: ease of use.
- k) Information management.
- l) Assumptions, compromises and limitations.

- m) TTM reliability: repeatability and consistency
- n) TTM validity: appropriateness, accuracy and utility.
- o) Overall assessment.
- p) Evaluation of fitness for purpose.
- q) Proposals for future assessments of reliability and validity.
- r) List of references.
- s) Glossary
- t) TTM Reliability and Validity Summary Sheet (in an Annex).

5.0 KEY RELIABILITY AND VALIDITY ISSUES

The previous section outlined the recommended process for conducting an R&V assessment. This section details the key issues that should be considered during this process. These issues will mostly be addressed during the review phases, although some will be relevant to the testing/comparison phases. All issues should be addressed as fully as possible, in line with the recommendations in sub-section 4.3.1. The assessment results should be recorded in the log book.

The issues in this section are considered particularly relevant to the R&V of Influence Ops TTMs because they involve the subjective analysis, interpretation and prediction of human and social behaviour. These activities are inherently subject to inconsistency, bias and misunderstanding. This section therefore provides recommended practical procedures, tests and approaches that can help mitigate these issues and increase R&V. Key issues that will be covered are:

- a) The purpose(s) of the TTM.
- b) The individual constituent parts of the TTM.
- c) The underpinning social science theories.
- d) The SMEs.
- e) The utilisation of data.
- f) The management of staff, TTM development and TTM use.
- g) The outcomes (including specific analytical outputs if any).

5.1 The Purpose(s) of a TTM

Influence Ops TTMs can be developed for a variety of different purposes. These may be to include, but not exclusively, facilitation of Influence Ops decision-making processes, provision of situational awareness on the attitudes of a target audience, or provision of analysis to support Influence Ops activities intended to influence specific groups or individuals. Influence Ops TTMs can only be considered valid if they are actually capable of fulfilling these specific intended purpose(s). This has several key implications:

- a) There should be an interested end-user community which should have a specific purpose for the TTM to fulfil.
- b) The TTM should be capable of fulfilling the purpose(s) within an agreed timeframe and of effort.
- c) The developer(s) should have a clear understanding of the purpose of the TTM.
- d) Initial research should be carried out to ensure that there are no suitable existing alternatives. If new TTMs are to be developed then they should provide something that no existing alternative

already does, or they should fulfil the purpose more proficiently and cost-effectively than any predecessor.

An additional issue to consider is that Influence Ops TTMs will support the planning and execution of activities that will affect people, who are reactive subjects that understand our actions and can respond to them. Influence Ops activities can therefore bring about unintended and undesired consequences. Thus, it is important that TTM developers advise and educate their customer whenever they identify any key issues that may challenge the feasibility of achieving the intended purpose. There are two key steps that can support this:

- **Inter-subjective analysis.** Where possible, analytical TTMs should involve direct interaction and consultation with the subject, which will provide the most accurate interpretation of the attitudes, behaviour and ethical norms informing that subject's community. Ideally this should be conducted in the language of the subject or using a translator if necessary. Inter-subjective analysis will better identify whether the intended purpose is likely to significantly challenge current attitudes, behaviour and ethical norms of that subject. This informs the end user of the likelihood of the success of an Influence Ops activity. This analysis is often used in 'participatory Information Operations', which are commonly conducted in post-conflict situations, where the purpose is to change the attitudes and behaviour of an indigenous population.
- **Indirect consultation.** Because Influence Ops vary in their type and methodology there may be cases where direct interaction with a subject is not possible, such as TTMs that result in the production of remote assessments of key individuals. In these cases, consultation with the closest possible substitute, such as friends, relatives, colleagues, Diaspora or SMEs, is the next best alternative and should help maintain the relative accuracy of any interpretation. Again, any key issues identified through this analysis, which may challenge the feasibility of the intended purpose, should be relayed to the customer.

5.2 The Individual Constituent Parts of a TTM

Influence Ops TTMs may consist of several individual constituent parts. These may be specific TTMs, such as interviews, facilitated discussion sessions, focus groups, questionnaires, surveys and/or content analysis software tools (and this list is not exhaustive). These individual parts form an element of the overall TTM and as such also affect its overall R&V. A number of associated R&V issues should, therefore, be considered for the following approaches:

- **Interviews and surveys.** Methods such as surveys or interviews may not be appropriate for use in certain countries, societies, cultures, situations or contexts. If these methods are to be used then the questions should be carefully considered and selected, based on advice from SMEs.
- **Software tools.** Where software tools are used (e.g. content analysis tools) to automate or assist a manual process, the comparative fitness for purpose of the approaches should be established. A test comparison should be conducted. This should highlight any notable differences between the approaches and should ultimately support an end user in evaluating the risks of utilising a particular approach. For example, the end user may be willing to accept lower levels of accuracy from automated coding, in exchange for the ability to process large volumes of data and a more timely output.
- **Focus groups and structured discussions.** Focus groups and other facilitated, structured discussion techniques should be conducted using a consistent approach that is reproducible and seeks to minimise bias. Differences in the outputs should ideally be due to differences in the inputs, not in the process.
- **Human inputs.** The human input to any individual part of a TTM may be susceptible to variability and inconsistency. It is necessary to ensure that different TTMs users are conducting

these parts with a standardised, consistent and repeatable approach. This may include testing factors such as inter-coder reliability or ensuring consistency of training and skills in facilitation techniques.

5.3 The Underpinning Theories of a TTM

Influence Ops TTMs may utilise social science theories, from domains such as psychology, sociology or international relations, to focus and structure analysis of social behaviour. However, these theories are neither indisputable nor unchanging. They are relative to time and context, and reflect changes with new research discoveries and the consensus of opinion in the wider academic community. The following issues should therefore be considered:

- **Credibility of Theories.** Theories should have sufficient credibility within the social science domain from which they are drawn. There should be no widespread perception that a chosen theory is highly controversial, significantly flawed or can be easily falsified. There should also be significant supporting academic literature or research findings to suggest that a chosen theory is credible for supporting a particular type of analysis as part of an Influence Ops TTM. Any chosen theory should be a credible option amongst other alternatives and not selected solely due to the personal opinion of the TTM developer. It may be appropriate to take a pluralist approach and combine more than one theory, or even elements or multiple theories.
- **Appropriateness of Theories.** Theories should be appropriate for the purposes for which they will be utilised by an Influence Ops TTM. A chosen theory should ideally have been tested and used in previous research and, in particular, to analyse a similar topic to that which will be analysed by the Influence Ops TTM. Theories should also not be narrow and biased, such as to lead TTM users to ignore or undervalue relevant issues, or to bias any conclusions that are drawn.
- **Re-evaluating Theories.** Theories should be re-evaluated after specified time periods to ensure that they are still credible and appropriate. This re-evaluation should monitor academic literature and developments in the social science domains, from which theories are drawn, to identify whether there is any new research which significantly challenges the credibility or appropriateness of a theory. It can also help identify whether any new theories have emerged, which may be more credible and appropriate for the purpose, and therefore more valid.
- **Understanding and Incorporating Theories.** If social science theories are to be utilised then they should be accurately interpreted and incorporated into a TTM. A formal definition should be produced for any chosen theory, articulating the key principles and detailing how these will be applied. This can be reviewed by relevant SMEs for confirmation. Users of TTMs should clearly understand this formal definition and how the chosen theory is to be applied. This can be reinforced with standardised training to ensure a consistent level of understanding between different users.

5.4 Subject Matter Experts

The process of developing Influence Ops TTMs is likely to involve the use of SMEs. SMEs are usually consulted for their depth of knowledge and experience of a particular subject area. They may be a key source of input data and are also often involved in assessing the R&V of a TTM. It is therefore necessary to assess the R&V of the SMEs themselves, primarily because they are introducing an additional element of subjectivity to the development process. This assessment should focus on their authenticity, considering the following factors:

- Their expertise should be based on relevant personal experience.
- They should have a good reputation that is well-established in their domain of expertise, such as their academic community.

- They should be highly recommended by credible sources and fellow experts in their domain(s).
- They should have a good historical record of utilising their expertise to support the development or R&V assessment of these types of TTMs.
- The information they provide should be generally consistent with other sources (e.g. empirical events and SMEs).

5.5 The Utilisation of Data

Influence Ops TTMs can involve the use of both quantitative and qualitative data. This raises a number of R&V issues as the utilisation of data is a subjective process and involves interpretation. The analysis of data will always be susceptible to personal bias, misinterpretation and cultural or social misunderstanding. It is therefore necessary to acknowledge uncertainty in both data and the analysis process, and to strive for objectivity in the utilisation of data as far as possible.

- **Data Sources.** Data can be biased. If data are inappropriate or misleading then they can invalidate an analytical output. The background of input data should always be established and input data should ideally only be used if they are from a credible source. All input data should, where possible, have an audit trail. Validation of data sources should include SMEs, who can function as a source of input data. Guidance should be provided on preferred and recommended data. These should be re-evaluated on a regular, timely basis, to ensure continuing credibility and currency. A less credible source of input data may be utilised provided that:
 - The confidence required by the end user permits some degree of uncertainty.
 - The risks of utilising the data have been evaluated.
 - The outputs dependent on it are caveated accordingly.
- **Data Interpretation.** Once data have been obtained from credible sources, the nature of Influence Ops TTM means that some interpretation may be necessary before they can be utilised. Where possible, a standardised format or template should be established to guide TTM users in utilising input data. The template should detail the preferred approach for analysing and interpreting data, extracting information and forming conclusions. Data interpretations and resulting conclusions from one source should be compared with another for confidence and confirmation. Outputs from TTM used to analyse the same subject may be compared to check that each has interpreted the input data and subjects similarly. Where possible, interpretations should be reviewed by peers and SMEs to reduce the likelihood of personal prejudice and biased assumptions.
- **Data Management.** An up-to-date record should be maintained of all data that are used by an Influence Ops TTM. This record should include an assessment of all the data sources, their background, quality, credibility and any perceived limits on their accuracy. It should also provide an audit trail, detailing how each item of input data was used. This will provide a permanent testament to the assessments of R&V of data that have been conducted.

5.6 Management of TTM Developers, Users and Use

The development and use of Influence Ops TTMs must be managed appropriately. The R&V of TTMs depends significantly on the appropriateness of the people that develop and use them:

- TTMs developers should have a sufficient level of skill and expertise, which may include specialist knowledge in the subject area or previous experience in TTM development.
- TTM users should have received a sufficient level of relevant training to ensure that they understand the stated purpose, how the TTM works, any theories that are incorporated, any standardised approach for data utilisation, and how the TTM fulfils its purpose. Standard

requirements should be defined formalising the level of skill and amount of training considered necessary to use a TTM, including specific academic or professional qualifications, where appropriate. New and less-experienced TTM users should have a greater level of review and managerial oversight until they are independently capable of operating to standards consistent with other experienced users.

Conditions of use. A TTM may also only be considered reliable and valid when used under specified conditions. These conditions should be established during the development process and adhered to consistently. They should include boundaries defining when a TTM should, and should not, be used and the parameters within which it has been evaluated as fit for purpose. These conditions should also, where possible, provide guidance on the risks associated with using a TTM outside of these boundaries (e.g. this guidance should include how to assess the risk, to allow an evaluation of the limitations of the TTM against the nature and urgency of the decision that the TTM is informing).

5.7 The Outcomes of Using a TTM

Influence Ops TTMs support MoD staff with planning and executing Influence Operations. The outcomes of using these TTMs vary depending on type (e.g. increased situational awareness or support for the planning of specific activities). All outcomes should be achieved in the context of an ongoing dialogue with the end users. This will keep them informed of the R&V of a TTM and allow them to evaluate the risks of its utilisation in support of decision-making. TTM fitness for the stated purpose is based on two key factors: process validity and outcome utility.

Process validity. The validity of an outcome partially depends on the overall R&V of the process through which it was achieved. Following the guidelines contained in this document will help ensure a TTM has process validity.

Outcome utility. The validity of the outcome also depends on its utility to the end user. Influence Ops TTMs are useful if they pragmatically and constructively support a decision-maker with Influence Ops planning and execution. This means they should provide additional insight to a problem or subject area. The outcome should be achieved in an acceptable timeframe and if a specific analytical output is produced it should be delivered in a language that is clearly understood by the end user. In particular, using specific social scientific terminology or jargon should be avoided or explained in simple terms. It should be noted that utility should not be equated with convenience of use: an unreliable and invalid TTM should not be used to support decision-making just because it is easy to apply. The establishment of outcome utility is almost entirely dependent on receiving feedback from end users. Feedback should provide any compliments, constructive criticisms and recommendations, which will allow the TTM to be revised accordingly and help ensure it is refined until it can adequately fulfil its purpose.

6.0 SUMMARY

A structured and rigorous approach to R&V assessment is required to increase confidence in the TTMs used to support the planning and execution of Influence Ops intended to influence human and social behaviour.

This approach is intended to complement existing MoD UK guidance on the V&V of Operational Analysis modelling capabilities.

All TTMs should be subject to R&V assessment by review. Those TTMs that produce specific analytical outputs should also be subject to additional testing in controlled test cases and by comparison with outputs from other similar tools and historical data, where feasible and appropriate.

The assessment process should address a number of key issues. They include: the intended purpose of the TTM; the R&V of individual constituent parts; the underpinning social science theories; the SMEs; the utilisation of data; the management of TTM developers, users and use; and the outcomes of use. Practical procedures for review and assessment are contained within this document.

The results of the assessment process should be recorded in a log book. A recommended template is provided at Annex A. The log book is a key document enabling the end user to evaluate fitness for purpose and the risk of uncertainty against the urgency of their requirement for use of the TTM. The log book should be continually updated to incorporate any developments and amendments.

7.0 REFERENCES

- [1] Guidelines for the Verification and Validation of Operational Analysis Modelling Capabilities, Director General (Scrutiny and Analysis), Dated Dec 2002

